AMENDMENTS TO THE CLAIMS:

There are no amendments to the claims; however, this listing of claims is provided for the convenience of the Examiner.

LISTING OF CLAIMS:

1. (Previously Presented) An inductively coupled plasma (ICP) generating apparatus comprising:

an evacuated reaction chamber;

an antenna installed at an upper portion of the reaction chamber to induce an electric field for ionizing reaction gas supplied into the reaction chamber and generating plasma; and

a radio frequency (RF) power source connected to the antenna to apply radio frequency power to the antenna,

wherein the antenna comprises a plurality of coils comprising an open ended first continuous serpentine coil, an open ended second continuous circular coil, and an open ended third continuous serpentine coil surrounding the first continuous serpentine coil, wherein the first and third serpentine coils are bent in a zigzag pattern, and wherein the first and third serpentine coils comprise an outer loop, an inner loop, and connecting portions between the outer loop and the inner loop, wherein the outer loop of the first serpentine coil and the outer loop of the third serpentine coil are approximately parallel, the inner loop of the first serpentine coil and the inner loop of the third serpentine coils are approximately parallel, the connecting portions of the first serpentine coil are approximately parallel to the connecting portions of the third serpentine coil and are longer than the connecting

portions of the third serpentine coil, and the first serpentine coil does not overlap or cross the any portion of the third serpentine coil.

2. (Previously Presented) The inductively coupled plasma generating apparatus of claim 1, wherein the circular coil is arranged at a center portion of the antenna and the first serpentine coil is arranged around and connected to the circular coil, and wherein the third serpentine coil is shaped to nest around and outline the first serpentine coil.

3. (Original) The inductively coupled plasma generating apparatus of claim 2, wherein the circular coil has a relatively small radius to reduce the area of opposing portions between the circular coil and the serpentine coil.

4-8. (Cancelled)

9. (Previously Presented) The inductively coupled plasma generating apparatus of claim 1, wherein the first and third serpentine coils have a zigzag pattern with equally spaced outer loop and inner loop sections, and wherein the first and third serpentine coils have an equal number of equally spaced outer loop and inner loop sections.

10. (Previously Presented) The inductively coupled plasma generating apparatus of claim 9, wherein the first and third serpentine coils have a plurality of

outer portions extending along the circumference and a plurality of inner portions bent toward the center portion.

11. (Previously Presented) The inductively coupled plasma generating apparatus of claim 10, wherein the inner and outer loops of the first and third serpentine coils are arranged to correspond to center and edge portions of the reaction chamber, respectively.

12. (Previously Presented) The inductively coupled plasma generating apparatus of claim 1, wherein the plurality of coils further comprise at least one connection coil, wherein the connection coil connects the first serpentine coil and the circular coil of the plurality of coils.

13. (Previously Presented) The inductively coupled plasma generating apparatus of claim 1, wherein the first serpentine coil's zigzag pattern has a rectangular cross-section having a width smaller than height.

14. (Previously Presented) The inductively coupled plasma generating apparatus of claim 1, wherein the circular coil has a continuous circular cross-section.

15. (Original) The inductively coupled plasma generating apparatus of claim 1, further comprising a plurality of permanent magnets arranged around the outer wall of the reaction chamber.

16. (Original) The inductively coupled plasma generating apparatus of claim 15, wherein the plurality of permanent magnets are arranged around the outer wall of the reaction chamber such that their N and S poles alternate.

17. (Original) The inductively coupled plasma generating apparatus of claim 15, wherein the plurality of permanent magnets are arranged at a region where the magnitude of a magnetic field generated by the antenna is relatively weak.

18. (Original) The inductively coupled plasma generating apparatus of claim 15, wherein the plurality of permanent magnets are arranged such that they can revolve simultaneously about a central axis of the reaction chamber to shift their positions according to the distribution of the magnetic field generated by the antenna.

19. (Original) The inductively coupled plasma generating apparatus of claim 1, further comprising:

a matching network connected between the radio frequency power source and the antenna; and

a capacitor connected between the matching network and the antenna, in parallel with the antenna.

20. (Original) The inductively coupled plasma generating apparatus of claim 19, wherein the plurality of coils of the antenna are connected in series to the radio frequency power source.

21. (Original) The inductively coupled plasma generating apparatus of claim 19, wherein at least one of the coils of the antenna is connected in parallel to the radio frequency power source.

22-24. (Cancelled)

25. (Previously Presented) The inductively coupled plasma generating apparatus of claim 1, wherein the first and third serpentine coils and the circular coil are three separate coils, and further comprising a first connection coil that communicatively connects the first serpentine coil to the circular coil and a second connection coil that communicatively connects the first serpentine coil to the third serpentine coil.

26. (Previously Presented) The inductively coupled plasma generating apparatus of claim 1, wherein the inner and outer loops of the third serpentine coil, the inner and outer loops of the first serpentine coil and the circular coil are concentric.

27. (Previously Presented) The inductively coupled plasma generating apparatus of claim 1, wherein the first continuous serpentine coil is connected to the

RF power source at the end away from the second circular coil, and wherein the second circular coil is connected to ground at the end away from the first continuous serpentine coil.

28. (Previously Presented) An inductively coupled plasma (ICP) generating apparatus comprising:

an evacuated reaction chamber;

an antenna installed at an upper portion of the reaction chamber to induce an electric field for ionizing reaction gas supplied into the reaction chamber and generating plasma; and

a radio frequency (RF) power source connected to the antenna to apply radio frequency power to the antenna,

wherein the antenna comprises a coil comprising an open ended serpentine continuous first portion, a separate open ended circular continuous second portion connected end to end from one end of the single serpentine first portion to one end of the single circular second portion, and an open ended serpentine continuous third portion surrounding, but not overlapping the serpentine continuous first portion.

29. (Previously Presented) The inductively coupled plasma generating apparatus of claim 28, wherein the circular continuous second portion is arranged at a center portion of the antenna, the serpentine continuous first portion is arranged around and connected to the circular continuous second portion, and the serpentine continuous third portion is arranged around and connected to the serpentine continuous first portion.

30. (Previously Presented) The inductively coupled plasma generating apparatus of claim 28, wherein the serpentine continuous first portion is connected to the RF power source at an end region away from the circular continuous second portion, and wherein the circular continuous second portion is connected to ground at an end region away from the serpentine continuous first portion.

31. (Previously Presented) The inductively coupled plasma generating apparatus of claim 28, wherein the serpentine continuous first portion, the serpentine continuous second portion, and the circular continuous second portion are separate coils, and further comprising a connection coil that communicatively connects the serpentine continuous first portion to the circular continuous second portion and the serpentine continuous first portion to the serpentine continuous second portion.

32. (Previously Presented) An inductively coupled plasma (ICP) generating apparatus comprising:

an evacuated reaction chamber;

an antenna installed at an upper portion of the reaction chamber to induce an electric field for ionizing reaction gas supplied into the reaction chamber and generating plasma; and

a radio frequency (RF) power source connected to the antenna to apply radio frequency power to the antenna,

wherein the antenna comprises three coils:

a first center, circular coil;

a second serpentine shaped coil surrounding the first coil; and

a third coil communicatively connecting the first coil to the second coil;

wherein the second serpentine shaped coil has inner portions shaped to nest in a complementary manner to the shape of the outer surface of the first coil, wherein the second serpentine shaped coil has outer portions shaped to nest in a complementary manner to the shape of the inner surface of the third coil, and wherein the second serpentine shaped coil has connecting portions connecting the inner portions and the outer portions and the connecting portions are aligned in approximately radial directions, wherein the third coil has inner portions complementary to the outer surface of the second coil, outer portions complementary to the inner surface of the reaction chamber and connecting portions connecting the inner portions and the outer portions, and wherein the first, second and third coils do not overlap one another.